

Claims

- [c1] An air dryer assembly for removing moisture and oil from a compressed air system comprising:
- a shell;
 - an inlet and an outlet;
 - a coalescing element disposed proximate the inlet having a coalescing material for removing at least oil from the compressed air;
 - a check valve disposed in parallel with the coalescing element in the inlet, the check valve forcing compressed air to pass through the coalescing element as the compressed air flows from the inlet to the outlet and allowing compressed air to bypass the coalescing element as purge air flows from the outlet to the inlet; and
 - an oil collection region located proximate to said check valve, wherein said purge air flow sweeps oil in said region to said outlet inlet bypassing said coalescing element.
- [c2] The air dryer assembly of claim 1 further comprising a shell, herein the shell includes an outer shell and an inner shell, the outer shell having a closed end and an open end, the open end operatively engaging a load

plate.

- [c3] The air dryer assembly of claim 3 further comprising a support member interposed between the inner shell and the load plate, the support member defining a sealed wall between the inlet and outlet.
- [c4] The air dryer assembly of claim 4 further comprising a biasing spring interposed between the support member and the inner shell for exerting a compacting force on a desiccant material contained within said shell and urging the support member toward sealed engagement with the load plate.
- [c5] The air dryer assembly of claim 1 wherein the coalescing element includes a material that forms oil droplets from aerosols passing therethrough.
- [c6] The air dryer assembly of claim 1 further comprising a wicking element operatively associated with the coalescing element for transferring droplets formed in the coalescing element to a location adjacent the check valve.
- [c7] An air dryer assembly for use in an air brake assembly, the air dryer assembly comprising:
 - a housing having an internal chamber, and an inlet and an outlet in selective communication with the chamber;
 - an oil filter assembly interposed between the inlet and

the internal chamber; and
a check valve disposed in parallel relation with the oil filter assembly and interposed between the inlet and the internal chamber the check valve precluding air flow therethrough from the inlet toward the internal chamber and allowing purge air flow therethrough from the internal chamber to the inlet.

[c8] The air dryer assembly of claim 7 further comprising an oil collection region located proximate to said check valve, wherein said purge air flow sweeps oil in said region to said outlet inlet bypassing said coalescing element

[c9] The air dryer assembly of claim 7 further comprising a support member for retaining the oil filter assembly and check valve in the housing, the biasing assembly interposed between the support member and the internal chamber

[c10] The air dryer assembly of claim 7 wherein the housing includes an outer shell and an inner shell, the outer shell having a closed end and an open end, the open end operatively engaging a load plate.

[c11] The air dryer assembly of claim 10 further comprising a support member interposed between the inner shell and

the load plate, the support member defining a sealed wall between the inlet and outlet.

- [c12] The air dryer assembly of claim 7 wherein the oil filter assembly includes a material that forms oil droplets from aerosols passing therethrough.
- [c13] The air dryer assembly of claim 7 further comprising a wicking element operatively associated with the oil filter assembly for transferring oil droplets formed in the oil filter assembly to a location adjacent the check valve.
- [c14] An air dryer assembly for removing moisture and oil from a compressed air system comprising:
 - a housing having an internal chamber, and an inlet and outlet in selective communication with the chamber;
 - an oil filter assembly interposed between the inlet and the internal chamber for removing oil from air; and
 - a means for permitting air flow in only one of two directions, such that purge air passes through oil collected in a oil collection region and out the outlet inlet without passing through said oil filter assembly.
- [c15] The air dryer assembly of claim 14 wherein the means for permitting air flow in only one of two directions allows for air to pass from the inlet to the outlet through the oil filter assembly, but does not allow air passing

from the outlet to the inlet to pass through the oil filtering assembly.

[c16] The air dryer assembly of claim 15 wherein the means for permitting air flow in only one or two directions comprises a check valve disposed in parallel with the oil filter assembly.

[c17] A method of drying and filtering compressed air comprising:
flowing compressed air into an inlet of an air dryer assembly;
passing the compressed air through an oil filter assembly to the outlet of the air dryer assembly;
flowing purge air from the outlet and through a means of restricting air flow and to the inlet outlet of the air dryer assembly, wherein said purge air flows through oil collected in an oil collection region and to said inlet outlet without passing through said oil filter.

[c18] The method of claim 17, wherein the purge air does not pass through the oil filter assembly.

[c19] The method of claim 17, wherein the means for restricting air flow comprises a check valve disposed in parallel with the oil filter assembly.